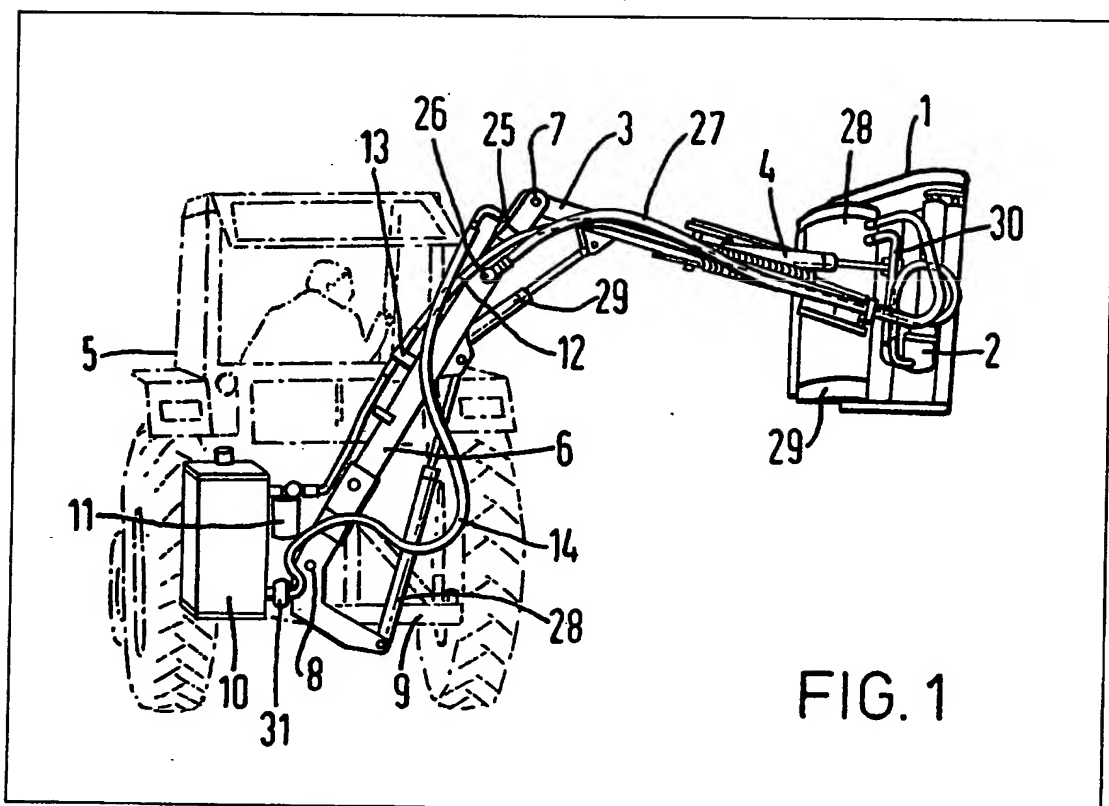


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(54) Hydraulic Drives for Hedgecutters and like machines

(57) In a tractor-mounted hedge-cutter or like machine in which a work-head (1) provided with a hydraulically driven rotary cutter is mounted on the outer end of an articulated, laterally extending boom (3, 6) of which the inner section (6) is pivotally mounted at its inner end on a frame (9) attached to the tractor, cooling of the oil in the hydraulic driving system for the rotary cutter is effected by passing the oil returning from a hydraulic driving motor (2) mounted on the work-head, first through a blister or cavity (28) provided in the cutter hood or guard (29) and then through the hollow interior of the boom section (6) to a storage tank (10) mounted on the frame (9).



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A detailed technical line drawing of a tractor-mounted hydraulic excavator arm. The drawing shows the rear of a tractor with a large rear wheel (10) and a smaller front wheel (11). A hydraulic pump (5) is mounted on the tractor's rear. A hydraulic line (13) runs from the pump to the excavator arm. The arm consists of a boom (3) and a dipper (4). The boom is connected to the tractor frame by a pivot (7) and a hydraulic cylinder (25). The dipper is connected to the boom by a pivot (26) and a hydraulic cylinder (27). The dipper has a bucket (28) at its end. The bucket is shown in two positions: a closed position (28) and an open position (29). The bucket is connected to the dipper by a pivot (30). The bucket has a hydraulic cylinder (2) at its base. The bucket is shown in a closed position (28) and an open position (29). The bucket is connected to the dipper by a pivot (30). The bucket has a hydraulic cylinder (2) at its base. The bucket is shown in a closed position (28) and an open position (29). The bucket is connected to the dipper by a pivot (30). The bucket has a hydraulic cylinder (2) at its base.

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FIG. 2

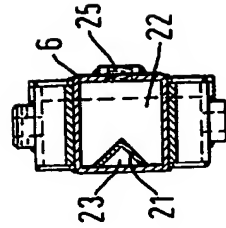
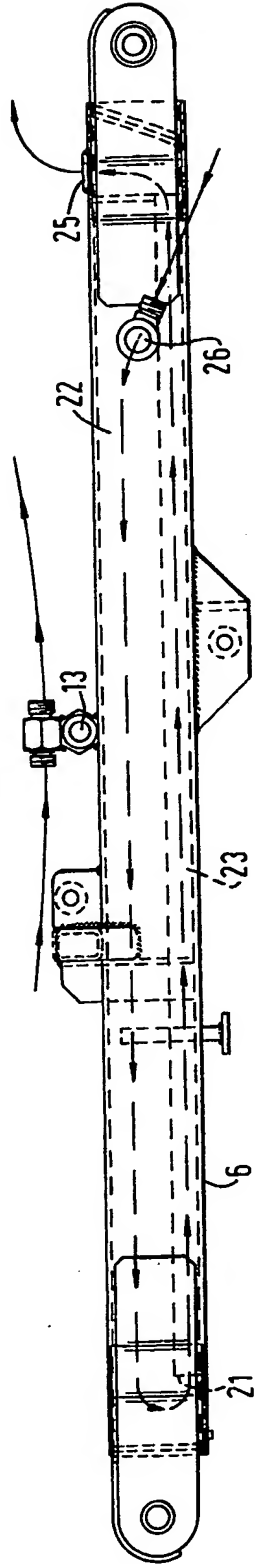
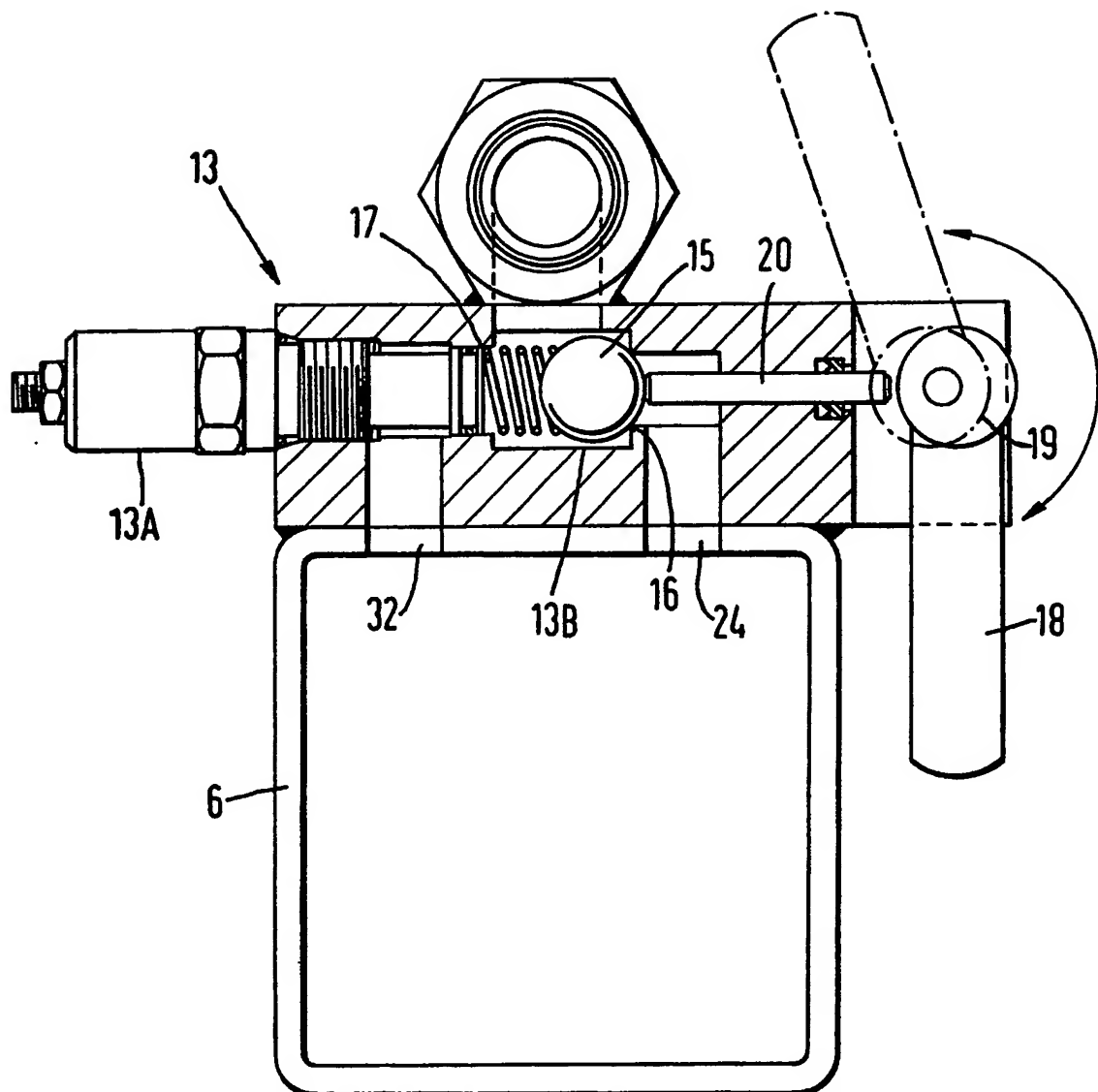
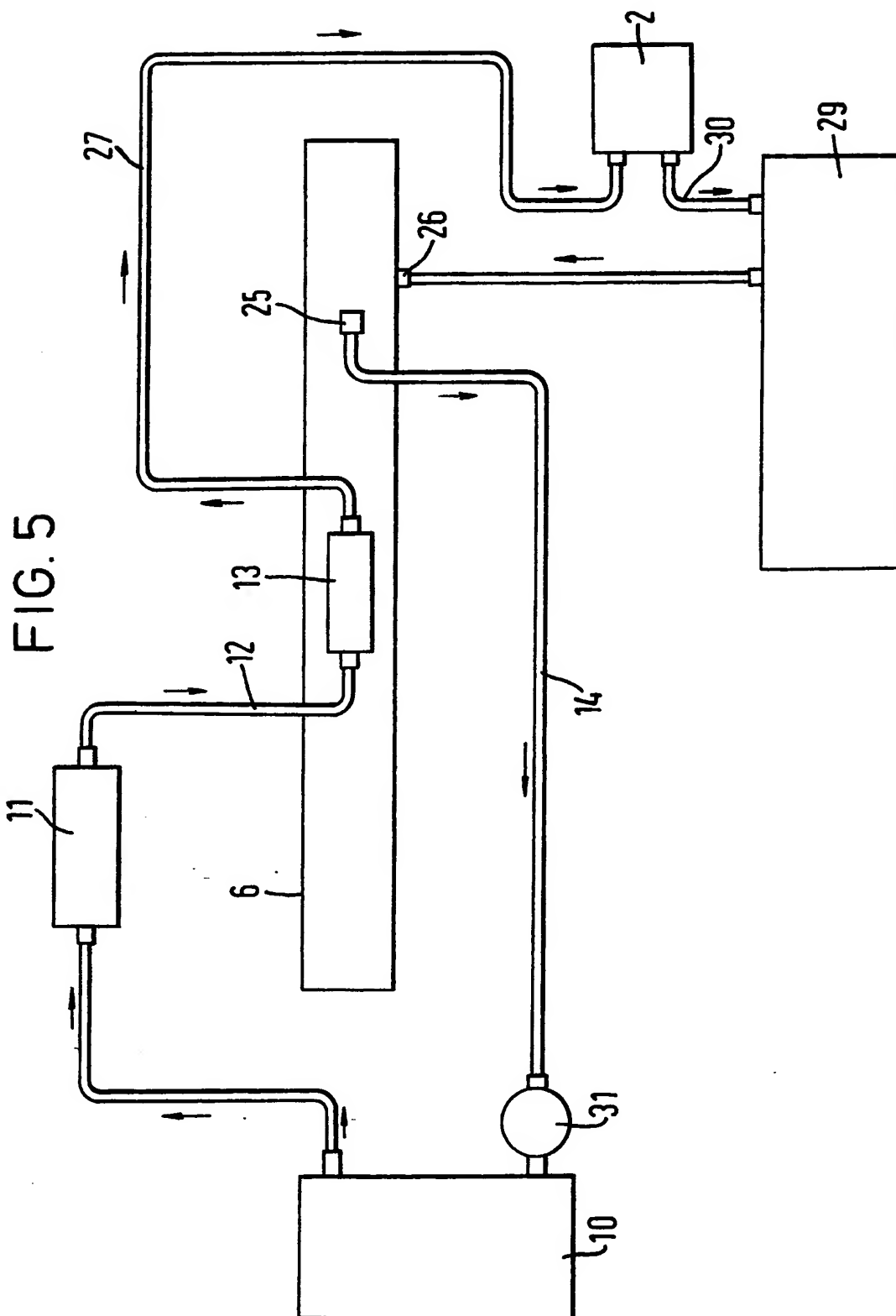


FIG. 3

FIG. 4



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SPECIFICATION

Hydraulic drives for hedgecutters and like machines

5 This invention relates to tractor-mounted machines for cutting or trimming hedges, grass, weeds, crops and other vegetable or arboreal growth and is particularly concerned with such machines in which a work-head provided with a hydraulically driven rotary cutter is mounted on the outer end of a laterally extending boom which is pivotally mounted at its inner end on the rear end of the tractor.

The object of the present invention is to effect adequate cooling of the oil in the hydraulic driving system for the rotary cutter and to this end, according to the invention, the oil returning from the rotary cutter is first passed through a blister or cavity provided on or in the usual cutter hood or guard and then through the interior of at least a part of the pivotally mounted boom to a storage tank located behind the tractor adjacent the inner end of the boom.

One embodiment of the invention will be described with reference to the accompanying drawings in which:

Figure 1 is a rear view of a machine in accordance with the invention, mounted on the rear end of a tractor;

30 Figure 2 is a fragmentary view, on a larger scale, of the inner section of the boom of Fig. 1;

Figure 3 is a section on the line III-III of Fig. 2;

Figure 4 is a fragmentary view, on a larger scale, of the valve assembly shown in Figs. 1 and 2; and

35 Figure 5 is a diagrammatic representation of the hydraulic operating circuit for the rotary cutter.

Referring to Fig. 1, a cutter head 1, incorporating a rotary cutter (not shown) driven by a hydraulic motor 2, is pivotally mounted on the outer section 3 of an articulated boom for movement relative to the boom by a hydraulic ram 4 supplied with oil from a tractor 5 or an independent pump driven by the tractor. The articulated boom has a hollow inner section 6 pivotally connected at 7 to the outer section 3 and at 8 to a frame 9 attached to the three point power-lift linkage of the tractor 5. The frame 9 also carries an oil tank 10 adjustable transversely thereon with respect to the inner boom section 6 and a pump 11 for forcing oil under pressure from the tank through a flexible line 12 connecting the outlet of the tank to the motor 2. A valve assembly 13 in the pressure line 12 is mounted on the boom section 6 and includes a pressure relief valve 13A and a bypass valve 13B which latter serves to connect the pressure line to the tank 10 through the interior of the boom section 6 and a flexible return line 14 when a ball valve member 15 (Fig. 4) is displaced from its seat 16 against the action of a spring 17 by a manually operable lever 18 acting through an eccentric 19 on a push rod 20. The interior of the boom section 6 is divided by a partition 21 (Fig. 3) into an upper compartment 22 and a lower compartment 23. The upper compartment 22 is connected through an aperture 32 to the relief valve 13A and through apertures 24 (Fig. 4) and 25 (Figs. 2 and 3) to the bypass valve 13B

and return line 14 respectively and the lower compartment 23 is connected through a port 26 to a return line 27 (Fig. 1) from a blister or cavity 28 formed in a hood 29 on the cutter head 1. The blister or cavity 28 is located close to the path of a high-speed stream of air and cut material emanating from the blades or flails of the rotary cutter and thus serves as a cooler for oil returning from the motor 2 through a flexible line 30 and this oil is further cooled in its passage through the boom section 6 on its way back to the tank 10. A filter 31 (Fig. 5) is disposed in the line 14 at a point adjacent the tank 10.

In operation the boom is extended by the required amount through the operation of rams 28 and 29 (Fig. 1) supplied with oil from the tractor 5 or an independent pump driven by the tractor and acting on the boom sections 6 and 3 respectively, and the cutter head 1 is correctly positioned by operation of the ram 4. The pump 11 is then operated to supply oil under pressure from the tank 10 to the motor 2 to drive the rotary cutter and the spent oil is returned to the tank via the cooling passages in the hood 29 and boom section 6 as is indicated by the arrows in Figs. 2 and 5.

Operation of the rotary cutter may be discontinued at will, without switching off the pump 11, by opening the bypass valve 13B to connect the pressure line 12 to the return line 14 through the interior of the boom section 6. For this purpose, the valve-operating lever 18 is either made accessible from the driving seat of the tractor or is arranged to be operated by remote control.

CLAIMS

100 1. A machine for cutting or trimming hedges, grass, weeds, crops or other vegetable or arboreal growth, said machine comprising a supporting frame for mounting upon the rear end of an agricultural tractor, a laterally extending boom pivotally mounted at its inner end on said supporting frame for movement about an axis substantially parallel to the longitudinal axis of the tractor, a work-head pivotally mounted on the outer end of said boom, means operable from the tractor for independently moving said boom and said work-head about their pivotal axes, a rotary cutter mounted in said work-head and a hydraulic system for driving said rotary cutter, said hydraulic system comprising a storage tank mounted on said supporting frame, a pump for supplying liquid under pressure from the storage tank to an hydraulic motor mounted on said work-head and operatively connected to said rotary cutter and means for cooling the liquid returning from said motor to said tank, said means including a blister or cavity in a hood or guard for said rotary cutter and the interior of at least a part of said boom.

2. A machine according to Claim 1, wherein the storage tank is so mounted on said supporting frame as to expose the greatest possible area of its outer surface to the ambient air and is adjustable laterally on said frame with respect to the inner end of said boom in order to serve as a counter-weight for the boom.

3. A machine according to Claim 1 or 2, wherein said blister or cavity is located close to the path of a

high-speed stream of air and cut material emanating from the blades or flails of the rotary cutter.

4. A machine according to any one of Claims 1 to 3, wherein said blister or cavity is provided with a

5 labyrinthine path for the flow of liquid therethrough.

5. A machine according to any preceding claim, wherein said boom comprises an inner section pivotally mounted on said supporting frame and having a hollow interior for the passage of said hyd-

10 raulic liquid and an outer section pivotally connected at its inner end to the inner section and provided at its outer end with said work-head.

6. A machine according to Claim 5, wherein said inner boom section is partitioned to form two lon-

15 gitudinally extending compartments which are traversed in succession by the liquid returning from said motor to said tank.

7. A machine according to any preceding claim, wherein a bypass valve is provided in the pressure line from the pump to the motor, said valve being manually operable to connect the pressure line directly to the interior of said boom and thus by-pass said motor.

8. A machine according to any preceding claim provided with a filter in the return line to said tank.

9. A machine for cutting or trimming hedges, grass, weeds, crops and other vegetable or arboreal growth, substantially as hereinbefore described with reference to and as shown in the accompanying
30 drawings.